



## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2021-0306; Project Identifier MCAI-2020-01493-E]**

**RIN 2120-AA64**

#### **Airworthiness Directives; Rolls-Royce Deutschland Ltd & Co KG (Type Certificate previously held by Rolls-Royce plc) Turbofan Engines**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** The FAA proposes to supersede Airworthiness Directive (AD) 2020-15-12, which applies to certain Rolls-Royce Deutschland Ltd & Co KG (RRD) Trent 1000 model turbofan engines. AD 2020-15-12 requires initial and repetitive ultrasonic or visual inspections of the intermediate-pressure compressor (IPC) stage 1 rotor blade root (front face), IPC stage 2 rotor blade root (front and rear face), and IPC shaft stage 2 dovetail post (front face), and removal of any cracked parts from service. AD 2020-15-12 also requires an inspection after asymmetric power and cabin depressurization events. Since the FAA issued AD 2020-15-12, the manufacturer introduced IPC stage 1 and stage 2 rotor blades in kitted sets, which terminate the need for initial and repetitive ultrasonic or visual inspections for certain IPC parts. This proposed AD would continue to require initial and repetitive ultrasonic or visual inspections of certain IPC parts until replacement of the IPC stage 1 and stage 2 rotor blades with redesigned IPC stage 1 and stage 2 rotor blades in kitted sets. The FAA is proposing this AD to address the unsafe condition on these products.

**DATES:** The FAA must receive comments on this proposed AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <https://www.regulations.gov>. Follow the instructions for submitting comments.

- Fax: (202) 493-2251.
- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.
- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For service information identified in this NPRM, contact Rolls-Royce plc, Corporate Communications, P.O. Box 31, Derby, DE24 8BJ, United Kingdom; phone: +44 (0)1332 242424; fax: +44 (0)1332 249936; email: <https://www.rolls-royce.com/contact-us/civil-aerospace.aspx>; website: <https://www.rolls-royce.com/contact-us.aspx>. You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (781) 238-7759.

### **Examining the AD Docket**

You may examine the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-0306; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this NPRM, the mandatory continuing airworthiness information (MCAI), any comments received, and other information. The street address for Docket Operations is listed above.

**FOR FURTHER INFORMATION CONTACT:** Kevin Clark, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7088; fax: (781) 238-7199; email: [kevin.m.clark@faa.gov](mailto:kevin.m.clark@faa.gov).

### **SUPPLEMENTARY INFORMATION:**

#### **Comments Invited**

The FAA invites you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under ADDRESSES. Include “Docket No. FAA-2021-0306; Project Identifier MCAI-2020-01493-E” at the beginning of your comments. The most helpful comments reference a specific portion of the

proposal, explain the reason for any recommended change, and include supporting data. The FAA will consider all comments received by the closing date and may amend this NPRM because of those comments.

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in 14 CFR 11.35, the FAA will post all comments received, without change, to <https://www.regulations.gov>, including any personal information you provide. The agency will also post a report summarizing each substantive verbal contact received about this proposed AD.

### **Confidential Business Information**

CBI is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this NPRM contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this NPRM, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as “PROPIN.” The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public docket of this NPRM. Submissions containing CBI should be sent to Kevin Clark, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803. Any commentary that the FAA receives which is not specifically designated as CBI will be placed in the public docket for this rulemaking.

### **Background**

The FAA issued AD 2020-15-12, Amendment 39-21175 (85 FR 45081, July 27, 2020), (AD 2020-15-12), for certain RRD Trent 1000-A2, Trent 1000-AE2, Trent 1000-C2, Trent 1000-CE2, Trent 1000-D2, Trent 1000-E2, Trent 1000-G2, Trent 1000-H2, Trent 1000-J2, Trent 1000-K2, and Trent 1000-L2 model turbofan engines. AD 2020-15-12 was prompted by IPC rotor blade separations resulting in engine failures. Subsequently, the manufacturer identified the need to add new inspections and an optional terminating action, amend the asymmetric power condition for engine inspection, and to add an inspection after a cabin depressurization event. AD 2020-15-12

requires initial and repetitive ultrasonic or visual inspections of the IPC stage 1 rotor blade root (front face), IPC stage 2 rotor blade root (front and rear face), and IPC shaft stage 2 dovetail posts (front face), and removal of any cracked parts from service. AD 2020-15-12 also requires an inspection after asymmetric power and cabin depressurization events. The agency issued AD 2020-15-12 to prevent failure of the IPC rotor blades.

#### **Actions Since AD 2020-15-12 Was Issued**

Since the FAA issued AD 2020-15-12, the European Union Aviation Safety Agency (EASA), which is the Technical Agent for the Member States of the European Community, has issued EASA AD 2020-0240, dated November 5, 2020 (referred to after this as “the MCAI”), to address the unsafe condition on these products. The MCAI states:

Occurrences were reported on Rolls-Royce Trent 1000 ‘Pack C’ engines, where some IPC Rotor 1 and Rotor 2 blades were found cracked.

This condition, if not detected and corrected, could lead to in-flight blade release, possibly resulting in reduced control of the aeroplane.

To address this potential unsafe condition, Rolls-Royce initially issued Alert NMSB TRENT 1000 72-AJ814 and 72-AJ819 to provide inspection instructions for IPC Rotor 1 blades, and IPC Rotor 2 blades and IPC shaft Stage 2 dovetail posts, respectively. Rolls-Royce also issued NMSB TRENT 1000 72-J871 to provide rework instructions for the affected parts, and Alert NMSB TRENT 1000 72-AJ869 to inspect those post-rework parts.

Consequently, EASA issued AD 2017-0248 to require repetitive inspections of the affected IPC Rotor blades and IPC shaft Stage 2 dovetail posts and, depending on findings, removal from service of the engine for corrective action.

After that [EASA] AD was issued, Rolls-Royce issued Alert NMSB TRENT 1000 72-AK058 to provide instructions for a one-

time on-wing inspection. Consequently, EASA issued AD 2018-0073, retaining the requirements of EASA AD 2017-0248, which was superseded, to require an additional borescope inspection of certain engines and, depending on findings, removal from service of the engine for corrective action.

After that [EASA] AD was issued, it was determined that repetitive borescope inspections are necessary on all engines to ensure fleet-wide continued safe operation. Consequently, Rolls-Royce revised Alert NMSB TRENT 1000 72-AJ869, Alert NMSB TRENT 1000 72-AJ814, Alert NMSB TRENT 1000 72-AJ819 and NMSB TRENT 1000 72-J871, and issued NMSB TRENT 1000 72-AK060 to consolidate all inspection instructions. Consequently, EASA issued AD 2018-0084 (later revised), retaining the requirements of EASA AD 2018-0073, which was superseded, and requiring repetitive on-wing borescope inspections of the affected Rotor 1 parts and affected Rotor 2 parts and, depending on findings, removal from service of the engine for corrective action. That AD also introduced specific requirements for engines installed on aeroplanes involved in ETOPS, and inspection following operation in asymmetric power conditions.

Rolls-Royce then introduced NMSB Trent 1000 72-AK092 to provide inspections for the rear face of the Rotor 2 blades and NMSB TRENT 1000 72-AK060 was revised (R1) accordingly. Later, Rolls-Royce developed mod 72-J941, installing improved IPC Stage 1 and Stage 2 rotor blades, and issued the modification SB, providing the necessary instructions for in-service application. EASA issued AD 2018-0084R2 to exclude post-mod 72-J941 engines from the Applicability and introducing the modification SB as terminating action for the repetitive inspections as required by that [EASA] AD.

After that [EASA] AD was issued, Rolls-Royce issued NMSB TRENT 1000 72-AK313 and revised Alert NMSB TRENT 1000 72-AJ814, 72-AJ819 and 72-AK092 to introduce new inspections, new thresholds and new intervals, depending on engine configuration. These inspections are for all operations, ETOPS and non-ETOPS. The latest revision of the NMSB also amended the asymmetric power conditions for engine inspection and introduced cabin depressurisation as an event to trigger engine inspection(s). Consequently, EASA issued AD 2019-0250 to require introduction of the new inspections, replacing those previously imposed by EASA AD 2018-0084R2 (through NMSB TRENT 1000 72-AK060), and to remove the references to Engine Health Monitoring messages and ETOPS-related requirements. Since that [EASA] AD was issued, it was discovered that the manufacturing distribution of the individual blade frequencies could differ from the assumed values during certification of the SB TRENT 1000 72-J941, which means there may not be sufficient margin to prevent the blades from experiencing high vibration levels. Prompted by these findings, Rolls-Royce issued the modification SB to provide blade kitting instructions.

You may obtain further information by examining the MCAI in the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-0306.

#### **FAA's Determination**

This product has been approved by EASA and is approved for operation in the United States. Pursuant to our bilateral agreement with the European Community, EASA has notified the FAA of the unsafe condition described in the MCAI and service information. The FAA is issuing this NPRM because the agency evaluated all the relevant information provided by EASA and determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

## **Related Service Information under 1 CFR Part 51**

The FAA reviewed Rolls-Royce Alert Non-Modification Service Bulletin (NMSB) Trent 1000 72-AK313, Revision 1, dated August 22, 2019; and Rolls-Royce Alert Service Bulletin (SB) Trent 1000 72-AK430, Initial Issue, dated August 17, 2020. Rolls-Royce Alert NMSB Trent 1000 72-AK313 defines the initial inspection threshold and repeat inspection intervals for Trent 1000 IPC stage 1 rotor blade, IPC stage 2 rotor blade, and IPC shaft stage 2 dovetail posts. Rolls-Royce Alert SB Trent 1000 72-AK430 introduces the IPC stage 1 and stage 2 rotor blades in kitted sets and provides kitting instructions. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in ADDRESSES.

## **Other Related Service Information**

The FAA reviewed Rolls-Royce Alert NMSB Trent 1000 72-AJ814, Revision 5, dated May 3, 2019; Rolls-Royce Alert NMSB Trent 1000 72-AJ819, Revision 4, dated May 3, 2019; Rolls-Royce Alert NMSB Trent 1000 72-AK092, Revision 4, dated May 3, 2019; Rolls-Royce SB Trent 1000 72-J871, Revision 6, dated December 12, 2019; and Rolls-Royce SB Trent 1000 72-J941, Revision 1, dated February 6, 2019.

Rolls-Royce Alert NMSB Trent 1000 72-AJ814 describes procedures for performing an ultrasonic inspection (USI) of the IPC stage 1 rotor blades. Rolls-Royce Alert NMSB Trent 1000 72-AJ819 describes procedures for performing a visual borescope inspection of the IPC stage 2 rotor blades and IPC shaft stage 2 dovetail posts. Rolls-Royce Alert NMSB Trent 1000 72-AK092 describes procedures for performing a USI of the IPC stage 2 rotor blades. Rolls-Royce SB Trent 1000 72-J871 describes procedures for reworking or replacing the affected parts. Rolls-Royce SB Trent 1000 72-J941 describes procedures for installing the redesigned IPC stage 1 and stage 2 rotor blades.

## **Proposed AD Requirements in this NPRM**

This proposed AD would retain certain requirements of AD 2020-15-12. This proposed AD would continue to require initial and repetitive ultrasonic or visual inspection of the IPC stage 1 rotor blade root (front face), IPC stage 2 rotor blade root

(front and rear face), and IPC shaft stage 2 dovetail post (front face), removal of any cracked parts from service, and an inspection after asymmetric power and cabin depressurization events until the installation of the IPC stage 1 and stage 2 rotor blades in kitted sets. As a terminating action, this AD would require replacement of IPC stage 1 and stage 2 rotor blades with IPC stage 1 and stage 2 rotor blades in kitted sets.

### **Costs of Compliance**

The FAA estimates that this AD, if adopted as proposed, would affect 7 engines installed on airplanes of U.S. registry.

The FAA estimates the following costs to comply with this proposed AD:

#### **Estimated costs**

<b>Action</b>	<b>Labor Cost</b>	<b>Parts Cost</b>	<b>Cost per product</b>	<b>Cost on U.S. operators</b>
Inspect the IPC stage 1 rotor blade root (Front Face)	20 work-hours x \$85 per hour = \$1,700	\$0	\$1,700	\$11,900
Inspect the IPC stage 2 rotor blade root (Front Face) and IPC shaft stage 2 dovetail post (Front Face)	6 work-hours x \$85 per hour = \$510	\$0	\$510	\$3,570
Inspect the IPC stage 2 rotor blade root (Rear Face)	10 work-hours x \$85 per hour = \$850	\$0	\$850	\$5,950
Replace all 34 IPC stage 1 rotor blades (mandatory terminating action)	280 work-hours x \$85 per hour = \$23,800	\$52,360	\$76,160	\$533,120
Replace all 49 IPC stage 2 rotor blades (mandatory terminating action)	280 work-hours x \$85 per hour = \$23,800	\$48,755	\$72,555	\$507,885



The FAA estimates the following costs to do any necessary replacements that would be required based on the results of the proposed inspection. The agency has no way of determining the number of aircraft that might need these replacements:

**On-condition costs**

<b>Action</b>	<b>Labor Cost</b>	<b>Parts Cost</b>	<b>Cost per Product</b>
Replace all 34 IPC stage 1 rotor blades	280 work-hours x \$85 per hour = \$23,800	\$52,360	\$76,160
Replace all 49 IPC stage 2 rotor blades	280 work-hours x \$85 per hour = \$23,800	\$48,755	\$72,555
Replace the IPC drum assembly	144 work-hours x \$85 per hour = \$12,240	\$1,370,000	\$1,382,240

**Authority for this Rulemaking**

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, Section 106, describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701, General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

**Regulatory Findings**

The FAA has determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that the proposed regulation:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Would not affect intrastate aviation in Alaska, and
- (3) Would not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

#### **List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

#### **The Proposed Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

#### **PART 39 - AIRWORTHINESS DIRECTIVES**

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

#### **§ 39.13 [Amended]**

2. The FAA amends § 39.13 by:

- a. Removing Airworthiness Directive AD 2020-15-12, Amendment 39-21175 (85 FR 45081, July 27, 2020); and
- b. Adding the following new airworthiness directive:

**Rolls-Royce Deutschland Ltd & Co KG (Type Certificate previously held by Rolls-Royce plc):** Docket No. FAA-2021-0306; Project Identifier MCAI-2020-01493-E.

#### **(a) Comments Due Date**

The FAA must receive comments on this airworthiness directive (AD) action by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

#### **(b) Affected ADs**

This AD replaces AD 2020-15-12, Amendment 39-21175 (85 FR 45081, July 27, 2020).

#### **(c) Applicability**

This AD applies to Rolls-Royce Deutschland Ltd & Co KG (Type Certificate previously held by Rolls-Royce plc) Trent 1000-A2, Trent 1000-AE2, Trent 1000-C2, Trent 1000-CE2, Trent 1000-D2, Trent 1000-E2, Trent 1000-G2, Trent 1000-H2, Trent

1000-J2, Trent 1000-K2, and Trent 1000-L2 model turbofan engines, except those that have the redesigned intermediate-pressure compressor (IPC) stage 1 and stage 2 rotor blades introduced by Rolls-Royce (RR) Service Bulletin (SB) Trent 1000 72-J941, Initial Issue, dated December 6, 2016, or Revision 1, dated February 6, 2019.

**(d) Subject**

Joint Aircraft System Component (JASC) Code 7230, Turbine Engine Compressor Section.

**(e) Unsafe Condition**

This AD was prompted by IPC rotor blade separations resulting in engine failures. The FAA is issuing this AD to prevent failure of the IPC. The unsafe condition, if not addressed, could result in failure of one or more engines, loss of thrust control, and loss of the airplane.

**(f) Compliance**

Comply with this AD within the compliance times specified, unless already done.

**(g) Required Actions**

(1) After the effective date of this AD, before exceeding the initial inspection thresholds and repeat inspection intervals specified in Table 1 of RR Alert Non-Modification Service Bulletin (NMSB) Trent 1000 72-AK313, Revision 1, dated August 22, 2019 (RR NMSB Trent 1000 72-AK313 R1):

(i) Perform initial ultrasonic inspections (USIs) of the IPC stage 1 rotor blade root (front face).

(ii) Thereafter, perform repetitive USIs of the IPC stage 1 rotor blade root (front face).

(iii) Use the Accomplishment Instructions, paragraph 3.A.(1)(a) (on-wing) or 3.A.(2)(a) and (b) (in-shop), of RR NMSB Trent 1000 72-AK313 R1 to perform the inspections.

(2) After the effective date of this AD, before exceeding the initial inspection thresholds and repeat inspection intervals specified in Table 2 of RR NMSB Trent 1000 72-AK313 R1:

(i) Perform initial visual inspections of the IPC stage 2 rotor blade root (front face) and IPC shaft stage 2 dovetail post (front face).

(ii) Thereafter, perform repetitive visual inspections of the IPC stage 2 rotor blade root (front face) and IPC shaft stage 2 dovetail post (front face).

(iii) Use the Accomplishment Instructions, paragraph 3.B.(1)(a) (on-wing) or 3.B.(2)(b) (in-shop), of RR NMSB Trent 1000 72-AK313 R1 to perform the inspections.

(3) After the effective date of this AD, before exceeding the initial inspection threshold and repeat inspection intervals specified in Table 2 of RR NMSB Trent 1000 72-AK313 R1:

(i) Perform initial USIs of IPC stage 2 rotor blade root (rear face).

(ii) Thereafter, perform repetitive USIs of IPC stage 2 rotor blade root (rear face).

(iii) Use the Accomplishment Instructions, paragraph 3.C.(1)(a) (on-wing) or 3.C.(2)(a) (in-shop), of RR NMSB Trent 1000 72-AK313 R1 to perform the inspections.

(4) After the effective date of this AD, within 5 engine flight cycles (FCs) after each occurrence in which any engine operates in asymmetric power conditions at an altitude of less than 28,000 feet, perform the following inspections on the engine not affected by the power reduction or in-flight shutdown (IFSD):

(i) Perform initial USIs and visual inspections required by paragraphs (g)(1) through (3) of this AD.

(ii) Thereafter, perform the repetitive USIs and visual inspections required by paragraphs (g)(1) through (3) of this AD.

(iii) Use the service information and repetitive inspection thresholds required by paragraphs (g)(1)(iii), (2)(iii), and (3)(iii) to perform the inspections, as applicable.

(5) After the effective date of this AD, within 5 engine FCs following a cabin depressurization event, perform the following inspections on both engines installed on the airplane:

(i) Perform initial USIs and visual inspections required by paragraphs (g)(1) through (3) of this AD.

(ii) Thereafter, perform the repetitive USIs and visual inspections required by paragraphs (g)(1) through (3) of this AD.

(iii) Use the service information and repetitive inspection thresholds required by paragraphs (g)(1)(iii), (2)(iii), and (3)(iii) to perform the inspections, as applicable.

(6) If any IPC stage 1 rotor blade root (front face), IPC stage 2 rotor blade root (front face), or IPC stage 2 rotor blade root (rear face) is found cracked during any inspection required by this AD, replace the part with a part eligible for installation before further flight.

(7) If any IPC shaft stage 2 dovetail post (front face) is found cracked during any inspection required by this AD, replace the IPC drum assembly.

#### **(h) Mandatory Terminating Action**

At the next engine shop visit after the effective date of this AD, replace the IPC stage 1 and stage 2 rotor blades with redesigned IPC stage 1 and stage 2 rotor blades introduced by RR SB Trent 1000 72-J941, Revision 1, dated February 6, 2019. Install the blades as kitted sets using the Accomplishment Instructions, paragraph 3.C. (In-Shop), of RR Alert SB Trent 1000 72-AK430, Initial Issue, dated August 17, 2020. This replacement of the IPC stage 1 and stage 2 rotor blades as kitted sets is a terminating action for the initial and repetitive ultrasonic or visual inspection requirements, as applicable, required by paragraphs (g)(1) through (5) of this AD.

#### **(i) Definitions**

(1) For the purpose of this AD, an “asymmetric power condition” is the operation of the airplane at an altitude of less than 28,000 feet, experiencing either single engine take-off, engine fault (reduced power on one engine), or single engine IFSD, which includes execution of any non-normal checklist procedure.

(2) For the purpose of this AD, an “engine shop visit” is the induction of an engine into the shop for maintenance involving the separation of pairs of major mating engine case flanges, except that the separation of engine flanges solely for the purposes of transportation without subsequent engine maintenance does not constitute an engine shop visit.

#### **(j) Credit for Previous Actions**

You may take credit for the initial inspections required by paragraphs (g)(1) through (5) of this AD if you performed these inspections before the effective date of this AD using any of the following.

(1) RR Alert NMSB Trent 1000 72-AJ819, Revision 3, dated April 13, 2018, or earlier revisions;

(2) RR Alert NMSB Trent 1000 72-AJ814, Revision 4, dated September 28, 2018, or earlier revisions;

(3) RR Alert NMSB Trent 1000 72-AK313, Initial Issue, dated May 2, 2019; or

(4) RR Alert NMSB Trent 1000 72-AK092, Revision 3, dated February 28, 2019, or earlier revisions.

**(k) Special Flight Permit**

Special flight permits, as described in Section 21.197 and Section 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199), are subject to the requirements of paragraph (k)(1) of this AD.

(1) Operators who are prohibited from further flight due to a crack finding as a result of paragraph (g) of this AD, may perform a one-time non-revenue ferry flight to a location where the engine can be removed from service. This ferry flight must be performed without passengers, involve non-ETOPS operation, and consume no more than three FCs.

(2) [Reserved]

**(l) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, ECO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in Related Information. You may email your request to: ANE-AD-AMOC@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

**(m) Related Information**

(1) For more information about this AD, contact Kevin Clark, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7088; fax: (781) 238-7199; email: [kevin.m.clark@faa.gov](mailto:kevin.m.clark@faa.gov).

(2) Refer to European Union Aviation Safety Agency (EASA) AD 2020-0240, dated November 5, 2020, for more information. You may examine the EASA AD in the AD docket at <https://www.regulations.gov> by searching for and locating it in Docket No. FAA-2021-0306.

(3) For service information identified in this AD, contact Rolls-Royce plc, Corporate Communications, P.O. Box 31, Derby, DE24 8BJ, United Kingdom; phone: +44 (0)1332 242424; fax: +44 (0)1332 249936; email: <https://www.rolls-royce.com/contact-us/civil-aerospace.aspx>; website: <https://www.rolls-royce.com/contact-us.aspx>. You may view this referenced service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (781) 238-7759.

Issued on April 9, 2021.

Lance T. Gant, Director,  
Compliance & Airworthiness Division,  
Aircraft Certification Service.

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